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Noxious Times

A Quarterly Publication of the California Interagency Noxious & Invasive Plant Committee

In This Issue

Legislative Update:

Advocacy at the Capitols and SB 31 1

By Doug Johnson and Elizabeth Brusati, California Invasive Plant Council (Cal-IPC)

California's advocacy on invasive plant issues is organized by the California Invasive Weeds Awareness Coalition (CALIWAC), which comprises agricultural and environmental groups working together on invasive plant issues. Member organizations include Cal-IPC, California Native Plant Society, California Farm Bureau Federation, California Cattlemen's Association, California Forest Pest Council, and Regional Council of Rural Counties.

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Back from the Dead!

When Eradicated Weeds Come Back to Life

By Carri Pirosko, CDFA Noxious Weed Program

Editor's Note: This article is the second in a series about weed eradication. It was preceded by Robert Leavitt's article "Eradication: Goal or Pipe Dream?" in the Summer and Fall 2006 issue of the Noxious Times (Vol. 8, No. 2&3), available online at www.cdfa.ca.gov/noxtimes.

The Burning Questions:
When should eradication be a goal of your weed program?
When can you expect eradication to be "final"?

Some natural resource managers would argue that one does not have a sound weed program without including eradication as a goal. Without the complete elimination of the infestation, containment and management plans must be carefully planned to endure through change in management and available resources

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CINIPC Chair Message

Louanne McMartin

Louanne McMartin was introduced in the winter edition of the *Noxious Times* as the U.S. Fish and Wildlife Service's (Service) California and Nevada Operations Office (CNO) Non-native Invasive Species (NIS) Program Watershed Coordinator. We asked Louanne to fill us in on some of her experience as an official weed-whacker. Here is what she had to say.

image courtesy of Louanne McMartin

Louanne with her friend Chaco

I moved to California's Central Valley this past December from western Colorado where I worked as the Mesa County's Purple Loosestrife Project Coordinator. In that position I became immersed – literally- in NIS issues. I found myself crawling along the banks of the Colorado River in stands of purple loosestrife, tamarisk, Russian-olive and other NIS that towered over my head. As I stumbled through these dense thickets – poked and stabbed by thorns, thrashed and brow-beaten by branches – the term "bushwhack" took on a new meaning! Standing there soaked in mud and perspiration (with trickles of blood running down scratched body parts), it really hit home the problems NIS pose to wildlife, agriculture, and recreation and how that can impact local communities' economics and quality of life. I believe NIS issues are right up there with global warming in terms of environmental problems and that they are related issues as well. I am enthusiastic to be partners with other people who share the same vision to eradicate, control and manage NIS.

Noxious Times is a publication of the **California Interagency Noxious Weed Coordinating Committee** (CINWCC). The committee was formed in 1995, when 14 federal, state, and county agencies came together under a Memorandum of Understanding to coordinate the management of noxious weeds. The committee's mission is to facilitate, promote and coordinate the establishment of an Integrated Pest Management partnership between public and private land managers toward the eradication and control of noxious weeds on federal and state lands and on private lands adjacent to public lands.

The Noxious Times newsletter intends to help the committee achieve its goals of coordination and exchange of information by providing land managers throughout the state with information on weed control efforts, news, and successes.

Noxious Times is published quarterly by staff of the Integrated Pest Control Branch at the California Department of Food and Agriculture. We welcome submissions for our upcoming issues. Please send to: CA Department of Food and Agriculture, ATTN: Noxious Times, 1220 N Street, Room A-357, Sacramento, CA 95814 or e-mail: noxtimes@cdfa.ca.gov.

If you have a colleague whose name you would like to add to our mailing list, please send mailing information to the address above.

Noxious Times Editorial Staff: Steve Schoenig, Deborah Seiler, and Gina Darin. Text written by staff unless otherwise noted.

The CINIPC working group will continue to focus on Best Management Practices (BMPs) and Hazard Analysis and Critical Control Point (HACCP) programs. Through these programs we can implement plans that incorporate BMPs and HACCP measures. As an example, folks working in the field to remove NIS (purple loosestrife, *Arundo*, etc.) would have available to them a systematic approach to the identification, evaluation and control of potential NIS contaminants (seeds, plant parts, pathogens, etc.). Using these tool in NIS removal and monitoring can help field crews make sure their efforts are not in vain.

Louanne welcomes your comments and urges you to make her aware of topics you would like added to the CINIPC agenda. For Louanne's contact and professional background information check out:
www.delta.dfg.ca.gov/usfws

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UPDATE *continued from front page...*

Day at the Capitol in Sacramento

This year's Invasive Weeds Awareness Day at the Capitol was held March 14th in Sacramento. Fifty attendees heard presentations in the morning before visiting legislators in the afternoon. Determination was high to continue last year's program focus in renewing funding to the state's Weed Management Areas.

Presentations included reports from John Connell of the Dept. of Food and Agriculture, Susan Ellis of the Dept. of Fish & Game, Frank Carl from Sacramento County Agriculture, Diane Colborn from the Assembly's Water, Parks and Wildlife Committee, and Bob Falconer of the California Association of Nurseries and Garden Centers. Attendees also heard about the potential to fund weed management projects through programs at Dept. of Water Resources and the Wildlife Conservation Board. Finally, Tiffany Zurilgen, from state Senator Dave Cogdill's office, gave a brief summary of SB 311.

This year's advocacy goals were to support SB 311, which provides an additional $1million in funding for the WMA program, and to support implementation of the state's weed plan, especially the need for executive-level agency coordination. Also implicit in our visits was to make sure the many new legislators at the Capitol were aware of invasive plants as an important issue.

photo by Bob Case

Weed Day at the Capitol attendees listen to the morning's speakers

Twelve teams of weed workers visited all 120 legislative offices, and met with aides in more than half of those. The response was positive. CALIWAC will be sending representatives to hearings as they occur in order to support the WMA funding, and reminding legislators of the over 100 groups that sent letters of support last year.

Once the funding for the WMA program is made whole – this $1 million brings funding up to the total of $2.5 million approved by the legislature last year, but reduced – it will be important for CALIWAC to continue advocating for other long-running weed programs operated by CDFA and the county Agricultural Commissioners. CALIWAC protested cuts to these programs in years past, and believes they should be restored.

CALIWAC will also continue to discuss interagency coordination with CDFA and the Resources Agency. These agencies released the weed plan calling for enhanced coordination, and were asked by the Governor over two years ago to produce a plan for such coordination when he vetoed AB 2631 (Wolk) that would have created an interagency Invasive Species Council. The California Biodiversity Council established a task force to work on coordination, but its activity was short-lived. CALIWAC will support re-energizing this and other efforts.

NIWAW-8 in Washington, DC

Braving an ice storm, canceled flights, and lost luggage, CALIWAC sent seven attendees to the 8th Annual National Invasive Weeds Awareness Week in Washington, DC, February 25 – March 1. National Weeds Week brings together 150 participants from across the country to learn about federal agency programs on invasive plants and to lobby legislators for increased funding and improved policy for invasive plant projects.

This year's CALIWAC crew included Elizabeth Brusati and Melissa Dozier of Cal-IPC; Bob Case of the California Native Plant Society (CNPS) and Cal-IPC Board of Directors; Don Mayall of CNPS; Bob Pickard with the Mariposa County Board of Supervisors; Cal-IPC Past President Steve Schoenig of the California Department of Food and Agriculture; and Nelroy Jackson, who is retired from Monsanto and serves as Chair of the organizing committee for National Weeds Week. Two other Californians, Carl Bell with UC Cooperative Extension in San Diego, and Inyo-Mono Counties Agricultural Commissioner George Milovich, were stymied in their trip to Washington by canceled flights and were unable to attend as planned.

image courtesy of Nelroy Jackson

Say it with weeds: Amy Richard of Florida blends in with the white house topiary in her weed costume.

The team visited with staff of 15 Congressional representatives and both California Senators, then dropped off packets of information to a number of additional representatives. CALIWAC advocated five positions in 2007:

1. Support a $15 million appropriation for PL 108-412, the Noxious Weed Control and Eradication Act of 2004, for weed control through Cooperative Weed Management Areas. The President signed this act in Fall 2004, but Congress has not yet appropriated the authorized funds.
2. Support S 380 and HR 17, reauthorizing the Secure Rural Schools and Community Self-Determination Act of 2007, which among other things provides funding for weed management efforts in forested areas through the US Forest Service. Many California WMAs have received funds from this program.
3. Support S 241 and HR 658, the Natural Resources Protection Cooperative Agreement Act, to allow the National Park Service to collaborate with neighboring landowners on weed management. Other federal agencies such as the Forest Service and Bureau of Land Management are already allowed this type of collaboration.
4. Support a strengthened National Aquatic Invasive Species Act (HR 1591 and S 770 in the 109th Congress) to amend and reauthorize the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.
5. Support $2.5 million to enhance weed biocontrol development at the US Dept. of Agriculture laboratory in Albany (Alameda County), CA.

In addition, we helped circulate a letter drafted by attendees from Colorado to request funding for PL 109-320, the Salt Cedar and Russian Olive Control Demonstration Act of 2006. Like PL 108-412, this Act has been signed into law but has not received appropriation of funding from Congress.

Some Congressional staffers remembered us from previous years' visits and many were familiar with the problem of invasive species and supportive of work to control them. However, funding is tight and it is unlikely that money will become available for these programs during this session of Congress. Our goal is to keep the issue in front of Congressional aides so they can relay the information to the representatives. We hope to remind them that spending a relatively small amount of money now will prevent additional damage to the environment and economy and save money in the long run.

Contact the authors at dwjohnson@cal-ipc.org and edbrusatid@cal-ipc.org. ❖

Legislative Update: SB 311

Senate Bill 311 seeks to restore one million dollars in funds to CDFA's Noxious Weed Management Account. Originally approved at $2.5 million per year, the account distributes its monies to Weed Management Areas via county agricultural commissioners to use in approved noxious weed management plans. However, the amount was reduced to $1.5 million, a discrepancy SB 311 seeks to redress. SB 311 was introduced by Senator Dave Cogdill from California's 14th District on February 16, and was the central lobby goal for at this year's Weed Awareness Day at the Capitol.

Aquatic Invaders Update

Fallen Leaf Lake Boat Wash

Aquatic weeds are already a serious problem for many of California's waterways, but preventing the introduction of new invasives is important for all of them. According to Mike Kraft, a group of community leaders at Fallen Leaf Lake have devised a boat wash program in order to slow or prevent the growth of unwanted exotic plant and animal species at the lake. Kraft said that Eurasian watermilfoil, curly-leaf pondweed, and New Zealand mud snails are the prime invasive species targeted by their boat wash program. "These types of species pose a major threat to the healthy ecosystem currently enjoyed at Fallen Leaf Lake," said Kraft. If one or more of these invasive species were to establish, it could have a dramatic impact on the lake's wildlife, including lake minnows, cutthroat trout, Mackinaw trout, crayfish, ducks, Canada geese, and American bullfrogs. These aquatic invaders could also impede recreation, and would be extremely costly to eliminate.

The program will be operated by the boat launch/marina manager and will require boaters to wash their vessels, trailers, and engine components prior to entering the lake. A holding tank will capture the water from the wash and will distribute it to an existing leach field where any invasive species will be unable to survive. Fallen Leaf Lake area residents have generously donated all equipment and labor for the boat wash.

Hopefully, the program can prevent unwanted foreign species from taking hold at Fallen Leaf Lake, and can serve as a model for preventing weed introductions into other California aquatic environments.

Quagga Mussel reaches Lake Mead

Quagga mussels (*Dreissena bugensis*) are a sub-species of the infamous zebra mussel (*Dreissena polymorpha*), and have joined the zebra mussel's insidious spread from the Black Sea to the Great Lakes, and thence across the water bodies of America. With the average mussel the size of a pinto bean, quaggas easily go unnoticed on the bottom of boats, making lake-hopping recreational boaters the main spread vector. Earlier this year on January 6, these tiny invaders were discovered by the millions at Lake Mead, a high traffic reservoir just east of Las Vegas, despite long term efforts to keep the lake free of the similar zebra mussel.

The quagga mussel is more than able to keep up with its better-known cousin in terms of spread viability and damage wrought. The quagga can survive deeper water, colder temperatures, and can attach to softer surfaces than the zebra, and has already out-competed the zebra mussel in some regions of the Great Lakes. Adult females are capable of producing roughly one million eggs in a year. The impacts on their resident water bodies are profound. A bean-sized mussel can filter a liter of water a day, straining out algae and "cleaning" the water. However, without native algae, local invertebrates starve, which starves the small fish, which starves the big fish, and so on. Altered habitat paves the way for opportunistic species adapted to the new niche, inviting noxious weeds and other aquatic pests. Economic repercussions are potentially serious, too. Charles O'Neill Jr. of New York Sea Grant estimates that zebra and quagga mussels have cost the Great Lakes region $1 to $1.5 billion in control measures to date. The high-density mussels clog water intake valves as well. Installment of chemical feed lines to keep pipelines clear of mussels has cost between $50,000 to $1 million each. With the quagga mussel's new western stronghold claimed, boat treatment and vigilance will be more important than ever to protect California's waterways. ❖

General Prevention Procedures for Stopping Aquatic Hitchhikers

Although California has not yet established official protocols for dealing with transporting aquatic species from one water body to another, the following set of guidelines as outlined on www.protectyourwaters.net could provide protection from the unwanted transport of harmful plants and animals. In general, boaters and other aquatic recreational users should: (1) remove all visible mud, plants, fish or other animals from their clothing, equipment, boats, trailers, boots, fishing gear, etc. (2) eliminate water from all equipment including motors, jet and outdrives, live wells, bait buckets, scuba gear, etc. (3) clean and dry anything that came in contact with the water including pets. For detailed instructions on how to clean your equipment visit the Protect Your Water website.

ERADICATION *continued from front page...*

over time. On the other hand, some natural resource managers cringe when they hear the term eradication used as the goal of a pest management program. They argue that eradication is not feasible, primarily due to the fact that the potential for reinvasion can never be completely eliminated. Another factor is seed longevity in the soil. Weed managers who have been battling the good fight for decades know that most of our worst noxious and invasive weeds have seeds with long viability in the soil. Scotch thistle (*Onopordum acanthium*), an A-rated noxious weed on the California Department of Food and Agriculture's Noxious Weed List, has been documented to have a seed bank of at least 20 years in certain soil types. Scotch broom (*Cytisus scoparius*) has been documented to have seed banks at least 30 years under the right conditions.

Eradicate Defined…

erad·i·cate: to uproot; wipe out; stamp out; destroy

-Webster's New World Dictionary

Is Eradication Feasible?

Simply answered, yes. CDFA treats A-rated Noxious Weeds with the goal of statewide eradication. Have you ever heard of blueweed (*Helianthus ciliaris*) or Syrian beancaper (*Zygophyllum fabago*)? It is very unlikely that you recognize these species since they were eradicated entirely from the State. To date, 14 A-rated noxious weeds have been eradicated from the State and 4 more are approaching statewide eradication. Two examples of regional eradication successes include: *Hydrilla verticillata* from 9 counties and Scotch thistle from 12 counties.

Right: Slender false brome dominates a meadow in Oregon. *Above:* a Scotch thistle flower head.

CDFA file images

Does it really come down to timeframe?

How many seasons does it take to declare a site eradicated? Biologically speaking, for species like Scotch broom the answer would be at least thirty years. Realistically, successes and failures must be reported in much shorter timeframes to ensure continued funding and viability of programs. I've yet to see a funding body that recognizes the realities of long-lived seed banks. It is critical to have a record for yearly counts of plant numbers. A very important milestone in eradication is when, every year, 100 percent control is achieved for all plants before they are able to produce seeds.

Does it really come down to scale?

Eradication of yellow starthistle from the state of California: NOT FEASIBLE with current technology

O.K., so not many would argue that we can completely eradicate yellow starthistle from the state, due to the fact that over 8 million acres (conservatively) are already infested. But, eradication at a more local level is certainly an attainable goal. Several counties in the far northern, eastern, and southern reaches of the state have defined their yellow starthistle program goal as complete eradication. Of course, local eradication programs include acknowledgement of the constant pressure of reinvasion from outside sources.

Eradication of slender false-brome from the state of California: FEASIBLE

Slender false-brome (*Brachypodium sylvaticum*) is one of the state's most recent weed invaders. In 2006,

the California Department of Food and Agriculture listed slender false-brome as an A-rated species, suggesting eradication as the statewide program goal. Distribution is limited to only a few sites in the Santa Cruz Mountains. The Mid-Peninsula Regional Open Space District and partners are working diligently to eradicate this weed, which is a huge pest in the state of Oregon. If the program goal were not complete eradication, this aggressive, tufted, bunchgrass would certainly exist as a greater threat to surrounding areas.

In Conclusion:

These questions cannot be answered quickly or simply. This article merely introduces the issue, using examples from the California Department of Food and Agriculture's experiences. There are numerous projects from around the state, country and the globe that can be used as case studies to promote or refute the concept of eradication. In fact, PhD Candidate, Pete Holloran is currently in the middle of his thesis at UC Santa Cruz examining this very topic with case studies from both California and Australia. Mr. Holloran is examining social and political factors within eradication programs, along with elements of weed biology, scale, and time-frame. We are grateful for his work and look forward to reading about his findings and conclusions over the next several years. ❖

<u>Declared Eradicated</u>
Back from the Dead
Case Studies

Long-leaf Groundcherry
(*Physalis longifolia*)

CDFA file image

Long-leaf groundcherry (a.k.a. smooth groundcherry) is an A-rated noxious weed. Its last known location in the state was in Siskiyou County. In 1999, the site was well on it's way to eradication because no plants had been found for three years. Siskiyou County Ag Department inspected the site annually, and in 2004 plants were found again. The field had been disturbed, exposing seeds buried deep within the soil profile. The groundcherry plants were treated immediately as the site status was changed from being on its final survey back to an active state. The infestation is still active and will be inspected and pursued aggressively until eradication can be declared. This site is a clear example that annual surveys are a key component in an Eradication Program.

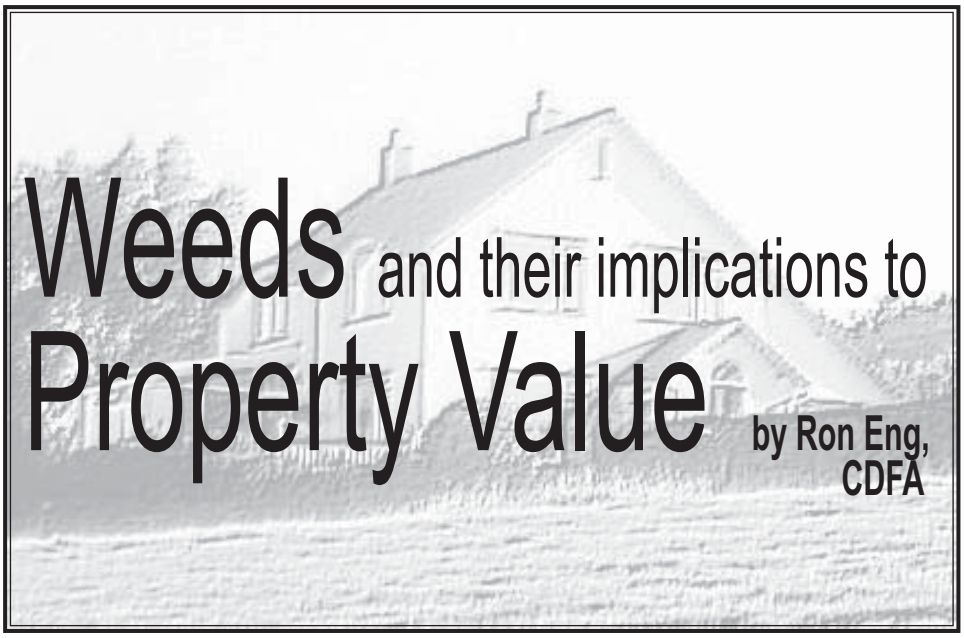
<u>Declared Eradicated</u>
Back from the Dead
Case Studies

Perennial sowthistle
(*Sonchus arvensis*)

CDFA file image

Perennial sowthistle, an A-rated noxious weed, was declared eradicated from the Tulelake basin in Modoc County in 1995. At the time, perennial sowthistle was only known to exist in two locations throughout the state. Nearly ten years later, a few perennial sowthistle plants were once again found growing on the edge of a field near Tulelake. The plants were immediately treated and no plants have been found at this site since, so the source of the infestation is somewhat unclear. If no plants are found at this location this season the site will once again enter the eradicated phase. Again, vigilant survey is a required element in an Eradication Program.

This article was written by Carri Pirosko with the California Department of Food and Agriculture's Integrated Pest Control Branch's Noxious Weed Program. You can contact her at cpirosko@cdfa.ca.gov



Weeds and their implications to Property Value

by Ron Eng, CDFA

Real estate is one of the largest purchases a person makes in her or his lifetime, often involving a loan with security based on the purchase property. With so much on the line, it is the seller's responsibility to represent the subject property accurately so that a potential buyers will know whats they are getting and what to expect after the close of escrow. Fraudulent misrepresentation or omissions place the property sellers and their agents in legal jeopardy. I will describe two short stories as examples of disclosure and the implications weed infestations have on a community.

In California in 1976, a seller used an agent to list his property for sale – a 3,000 square foot home on an acre of land, with a pool and guesthouse. Shortly after the new owner took occupancy, land subsidence caused sizable damage to the driveway. She then discovered that the floor of the guesthouse was not level and that the doorways were not square, which made closing doors difficult. The seller had needed to restabilize the soil on at least two occasions, which lead to speculation that this was what prompted the sale. The buyer learned that the property was built upon fill that was not properly engineered for stability and compaction. She brought suit against the seller and his agents for failure to disclose material defects prior to the time of sale. Despite a court appeal by the realtors, the law was upheld against them, and the seller became insolvent following the first judicial decision.

The case made it clear that disclosure requirements can have far-ranging implications, as they include anything that may impact the material value of residential property. In 1984, a California law was passed based on the case described that requires full disclosure of all defects materially affecting the value of residential property that are known or *should be known*, to be revealed to potential buyers before sale. Weeds can be a part of this. For example, if a property for sale is described as "for horses," the potential buyer should know of any weeds toxic to livestock or difficult to control that exist on the property so that they can determine if any weed elimination work is needed to make it suitable for horses. Realtors who represent buyers and sellers are responsible for providing due diligence to their clients so that transactions occur with understanding of all parties in mutual trust. Since realtors earn a percentage of the sales price in transactions, it is their fiduciary duty to provide protection to their clients and prevent unfair business advantage or fraud. California sellers are required by law to disclose any thing affecting the material value of the property to potential buyers prior to sale.

The immediate property is not the only land affected by the presence of weeds. In Montana, a film celebrity created conflict with the local community by refusing to use herbicides on his ranch. Although Seagal had filed a weed control plan with the County Agent, he did not take action to eliminate the weeds on his property. Adamantly

against using herbicides, the celebrity was at odds with long-time ranching neighbors who controlled their weeds. He blocked outside access to his weed-infested ranch, escalating tension and isolating himself from the irate local community. When a new owner bought the celebrity's ranch, the ranchers assumed that he would be just as resistant and difficult. The new owner received a cold welcome from the his neighbors, but responded by admitting he knew nothing about ranching and would support the locals by assisting with weed control. He conducted a fundraiser to buy new weed control equipment for shared community use. The new owners also kept their ranch open to welcome neighbors, and actively sought out their ranching advice. Slowly, the locals came to accept the new residents.

In Montana, weeds were the source of two distinct non-neighborly issues: a failure to follow through on weed control, and removing access to the property. Weeds are everyone's problem, especially in rangeland management, so if even just one ranch owner refuses to control weeds on his property, nearby ranchers have no chance of maintaining the control because of re-infestation at their borders.

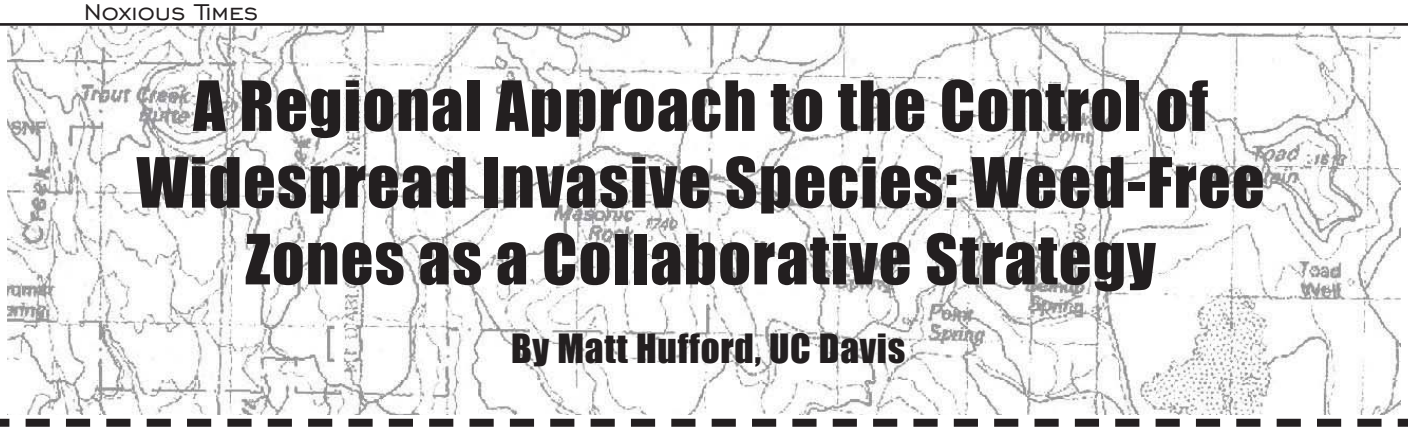
It is true that infestation disclosure can potentially reduce sale value (although likely less the cost of being sued). A recreational land sale in Oregon lost some value due to weeds, devalued $200,000 off of the original $2 million price. Similarly, grazing land in Montana has lost sale value from $400/acre to about $200/acre due to invasive and difficult to control weeds. The value of grazing land is based upon the ability of livestock to find adequate forage and the land's ability to support grazing long term. Ranch land leases are often described in cow-calf units that represent the amount of feed available to support a cow and/or calf on a given acreage of land. Land with high unit value, or, land that can support large numbers of livestock, has more value. Pristine grazing lands are prized, but are under continuous threat of invasion by noxious weeds. If no maintenance is done to prevent weed infestations, eventually desirable feed grasses are crowded out and there is less feed availability over time. Thus, unmaintained property is a costly nuisance for everyone.

Relatively benign, pampas grass "swallows" a home in the background. Noxious weeds may create a real estate devaluation to the immediate landholders and their at-risk neighbors.

Photo by Deborah Seiler

While real estate transactions continue to occur without the disclosure of weed problems, it is uncertain if disclosure requirements will change and extend to existing weed vegetation problems. In any case, it is best to disclose all information about the property for sale that may cause a change in property value. A good buyer's agent will provide protection to their client's needs and concerns by examining the property and requiring a professional evaluation or inspection of such things, similar to a home inspection that is typical prior to sale.

The real estate business is litigious because of the high value involved. An experienced and skilled real estate agent's service is well worth the commission they earn, both for the buyer's peace of mind and the seller's protection. ❖



A Regional Approach to the Control of Widespread Invasive Species: Weed-Free Zones as a Collaborative Strategy

By Matt Hufford, UC Davis

The path for eradication of incipient or A-rated weeds can often be quite clear. As Robert Leavitt described in a previous edition of the *Noxious Times* (Summer/Fall 2006), populations of incipient invaders should be controlled, eradicated, and then monitored for subsequent reoccurrence. Developing a plan of action for wide-spread, C-rated weeds like yellow starthistle – which covers 15% of the total land area of California – can be much more of a challenge due to funding limitations, the difficulty of establishing control priorities, and the high level of coordination and cooperation necessary to implement control strategies.

Innovative and long-term strategies are needed to manage C-rated weeds and prevent their spread into uninfested regions. In this article, the creation of "Weed-Free Zones" or "WFZs" is described as one potential approach to the control of widespread, C-rated weeds. The usefulness of this tactic is then described in the context of the yellow starthistle invasion in the Sierra Nevada and its foothills.

The Basic WFZ Approach:

A WFZ strategy focuses primarily on what stakeholders would like to protect from invasion by a C-rated weed. This focus will help stakeholders combat the sense of resignation often encountered when dealing with a C-rated weed. Furthermore, the strategy will clarify control priorities and responsibilities amongst the network of stakeholders within the WFZ. In forming a WFZ, stakeholders – likely through the existing network of Weed Management Areas (WMAs) in California – must delineate a defensible space that would greatly benefit economically or ecologically from the exclusion of a C-rated weed.

The Importance of Mapping:

Therefore, establishing a WFZ first involves a substantial regional mapping effort of the distribution of the C-rated weed to be excluded. Ideally this would include the creation of a Geographic Information Systems (GIS) database with layers representing the distribution of the weed, stakeholders in the region, conservation priorities, roadways and other vectors of invasive weed spread, and a rudimentary analysis of the potential distribution of the weed. This database will be an essential resource for stakeholders and project participants as they establish a plan of action and monitor the progress of WFZ efforts.

Once a GIS database is established for a C-rated weed in the region of interest, stakeholders should meet, potentially through WMAs, to discuss a plan of action for implementing a WFZ. The first order of business would be agreeing on a stop-the-spread line to border the WFZ. Placement of this line should be based on stakeholders' priorities and available resources for establishment and maintenance of the WFZ.

When the border of the WFZ is identified, stakeholders can begin to think about control and educational efforts within the WFZ. Ideally, control projects will be designed and guided by a committee of diverse stakeholders from the region, (e.g., federal land managers, agriculture commissioners, extension and utility workers, Caltrans, ranchers, farmers, etc.) In-depth discussion would be needed to establish each entity's responsibilities in each control project. Funds – in addition to those provided by stakeholders – could be secured by WMAs from funding agencies such as the California Department of Food and Agriculture (CDFA) and the National Fish and Wildlife Foundation. The stakeholder committee should closely monitor implementation of control projects, and the GIS database should be updated to reflect progress in the establishment of a new WFZ.

Expanding Education:

Once a WFZ is established (i.e., the C-rated weed is largely eliminated from the region) education and public outreach will be incredibly

important in maintaining it. Signs on roadways and education kiosks on trailheads could be used to educate the public regarding WFZs. These signs might include a picture of the C-rated weed and contact information for motorists to use if they spot it in the area. Education kiosks on trailheads could provide information on the ecological and economic harm caused by the weed, the importance of the WFZ as a cohesive region, and contact information to report weeds. "WFZ Hikes" can be organized for master gardeners, boy and girl scouts, school groups, and various other volunteers. Those volunteering could be briefed beforehand by a WMA member regarding the identification of the C-rated weed and the importance of keeping it out of the WFZ. Groups embarking on WFZ Hikes could be loaned a GPS unit to take down the coordinates of any populations of the weed they find. These types of activities will aid WMAs in early detection of and rapid response to incipient weed populations.

A concerted effort toward education and public outreach will ensure that WFZ success stories become common knowledge in the project region. As news spreads, stakeholders proximate to the WFZ will likely become interested in participating in control programs. This would be a great opportunity to expand the borders of the WFZ and encourage the stakeholder that they are part of a collaborative solution to a widespread problem.

The Sierra Nevada as a WFZ for Yellow Starthistle:

Yellow starthistle has invaded large portions of the Sierra Nevada foothills and is poised to invade higher elevations. Along major roadways, yellow starthistle is already stretching high into the Sierra. One population has even been found at 7000 feet on Donner Pass. Still, over 13 million acres of private, state, and federal lands east of the starthistle's primary leading edge – including Yosemite and Sequoia and Kings Canyon National Parks – remain uninfested. This region provides habitat for 48 plant and animal species that are listed as threatened or endangered on federal or state lists, as well as 204 plant species that the California Native Plant Society characterizes as rare, threatened, or endangered, and thus eligible for state listing. Yellow starthistle invasion would further decrease the quality of habitat for these species, as well as harm the region's recreation and cattle grazing. There are clear ecological and economic justifications for designating this area as a yellow starthistle WFZ.

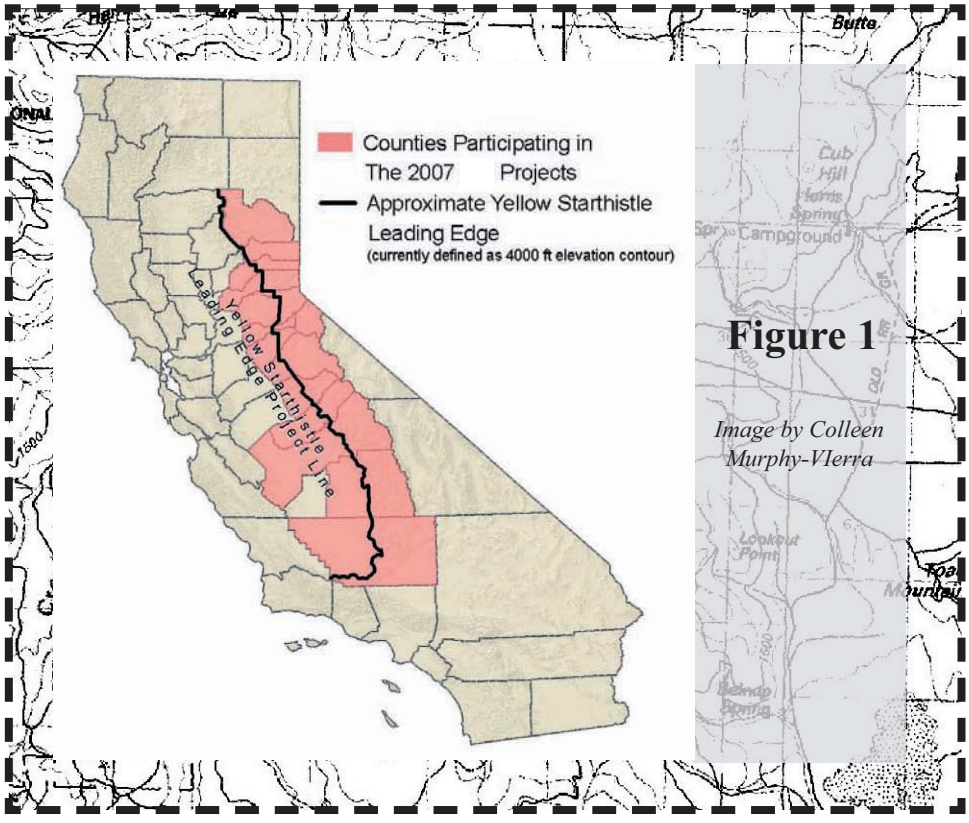


Figure 1

Image by Colleen Murphy-VIerra

Based on data from a mapping project funded by the National Fish and Wildlife Foundation, CDFA has defined the leading edge of the yellow starthistle invasion as illustrated in Figure 1. This line could serve as the western boundary of a sizeable WFZ for yellow starthistle. Implementing a WFZ on such a large scale will require monumental coordination and cooperation amongst stakeholders. A program coordinator will therefore be necessary, as will substantial funds to augment existing efforts of the region's stakeholders and WMAs in controlling yellow starthistle. CDFA has secured federal funds to begin implementing this project, which will be coordinated across fourteen Sierra Nevada counties. To establish the WFZ, priority yellow starthistle control projects will be funded first. Signs and education kiosks will be placed along major roadways and trailheads to increase public awareness on the importance of keeping yellow starthistle out of the Sierra Nevada. Ideally, this project will succeed in pushing the leading edge farther down the foothills, where it is currently causing much

ZONES *continued on page 15...*

CDFA Biologist Profile

Ron Eng

by Deborah Seiler

CDFA Biologist Ron Eng is just happy to work here. The Los Angeles native has come full circle from his start as a biology student at Sacramento State, through a long detour of work in construction, vegetation management, and pesticides, to arrive at his current position. Eng is a familiar face around CDFA's headquarters in Sacramento. On a walk through the building, it's not unusual for Eng to be stopped every hundred feet by friends he's made during twenty-five years of experience with the department. He reflects, "I didn't think I would ever be able to make a career as a biologist. It was a long road, but I feel very fortunate to be in this line of work."

Eng grew up in the Los Angeles suburb of Glendale, his hometown all the way through junior college. To finish his degree and try out another region of California, Eng enrolled at Sacramento State to complete his bachelor's degree in Biological Science in 1975. After a brief attempt to pursue a veterinary career through the Animal Science master's program at Cal Poly Pomona, Eng shifted gears and began his work with the state. He spent the next six years rotating between construction work and seasonal jobs with the county and state in the Los Angeles County Agricultural Commissioner's office.

In 1983, seeking a more lasting liaison with CDFA, Eng applied for a permanent position, and was eventually offered a job as Agricultural Biologist on a vertebrate control program in Modesto. The USEPA had directed CDFA to test and reregister pesticide materials, so Eng was able to call upon his science background to help him derive methods for testing pesticide efficacy. Any time not spent researching rodent control was dedicated to spraying noxious weeds. Ron's substantial experience with pesticide application made him the ideal candidate to write this issue's Toolbox entry on GPS-equipped spray packs, (see page 14).

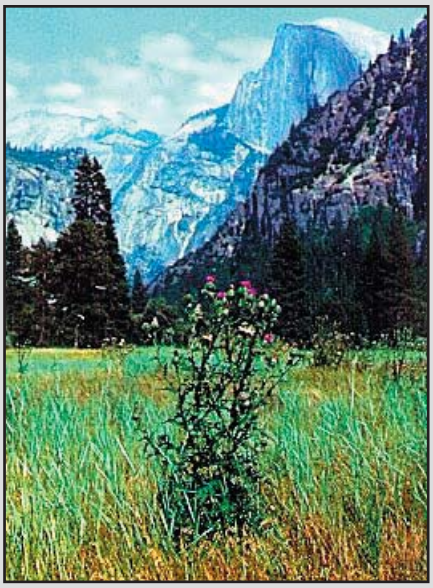


image by John M. Randall/The Nature Conservancy

Bull thistle gets a nice view of Half Dome from Yosemite Valley, the key locale of Ron Eng's region.

Eng's next shift in his career came in 1993, when tight times in the state budget lead to his relocation to the Folsom office. There he began his focus on weed management with a water hydrilla program on the Chowchilla River, Bear Creek drainage, and Clear Lake, beginning his transition from vertebrate to vegetation management. A few years later in 1997, CDFA promoted Eng to Associate Biologist.

By 1998, Eng was losing his capacity to walk through lengthy field surveys due to ruptured discs in his back. This turned him into specializing with Geographic Information Systems (GIS) from the office more often, focusing on data management and mapping. In January 2006, his long time expertise and experience in weed management earned him a job as the Central Sierra District Biologist for Madera, Mariposa, and Fresno counties, allowing CDFA to give detailed attention to California's national treasures in Yosemite Valley and the surrounding areas.

Eng's job duties as District Biologist involve the kind of breadth you would expect from such a position. First among them is a responsibility to assist the members of Weed Management

Area in his district by carrying out fieldwork and GPS data logging of weed infestations and management progress. Outreach is an important part of the job, with presentations on management and progress at weed-related meetings. District biologists also keep up to date on management strategies, and suggest alternatives when chemical herbicides are not applicable. Finally, Eng creates performance measures to monitor management effectiveness, and ensure that weed control makes the best headway possible within his district.

"My favorite work is in the field – although aging has made recovering from it slower. It is refreshing and satisfying to work when the temperatures are not too hot between 65-70 degrees, although I also enjoy working when there is snow on the ground and temperatures are in the 20's and 30's. Vertebrate work was enjoyable, but the weed surveys and treatments have great satisfaction, too. The discovery of an A-rated pest is always gratifying because your identification skills are being tested where others did not see the pest." While Eng loves field work, he also points out its pitfalls, including, "Fleas near the field rodent burrows… snakes and biting insects… plants that have stickers and thorns… long days in the direct sun during the summer staring into water that has an incredible glare…walking with heavily loaded backpack sprayers over rough terrain." While fieldwork can clearly require a special kind of tenacity, Eng is quick to temper the downsides with, "[You get] a fellowship with others who share the same environmental miseries as you dutifully perform your work."

Now stationed at CDFA's Sacramento headquarters, Eng has his home in Elk Grove, where he lives with his wife Kellie and their son Alex, who is finishing second grade. Ron and Kellie met during December of 1994 when, despite his plans to stay home, Ron agreed to be designated driver for a friend and headed out dancing – meeting his future wife on the dance floor. The relationship strengthened, and they were married before the following New Year. When not spending time with his family or working on his backyard, you might find Eng volunteering his time for the local Boy Scout Committee or occasionally making use of his SCUBA certification or private pilot's license. "I enjoy the low responsibility of off-duty times," says Eng. Including, he says, "a lot of napping."

Ron Eng gets close and personal in 1997 with one of California's biggest "pests" – a California black bear.

image courtesy of Ron Eng

With more than two decades of experience with CDFA, Eng has seen a lot of changes over the years on how the department manages weeds. He stresses foremost the profound impact of technology. "The biologists of today can do so many more things on paper than we could do in the past. You still need the practical training and science skills to conduct field surveys and design studies, but the new biologist is much more technologically savvy." Eng has seen the Department of Pesticide Regulation grow from its humble beginnings as an offshoot of CDFA into its own agency, "like a child-parent relationship." Within CDFA, department changes and diminishing budget have continued to squeeze weed management, forcing the department to become more effective with fewer staff. Herbicides had undergone a similar constriction, as environmental regulations increase and budgeting options decrease. "Today there are so many regulatory restrictions work must be done in a more deliberate way – slowly and carefully to prevent mistakes," Eng explains.

While the future may hold more twists and turns for Eng's role within the CDFA, his constantly expanding experience with pest exclusion will continue to protect the integrity of California's priceless land. ❖

Toolbox: Using GPS Technology to Assess the Efficacy of Vegetation Management

By Ron Eng, CDFA

TOOLBOX highlights new tools that might integrate well into local weed management tool boxes. Noxious Times *does not specifically endorse tools featured, but rather strives to provide baseline data that will lend itself to further examination and research on the part of the user.*

As technology has improved, so has our capacity to determine our location and record its attributes. Hand-held GPS units have progressed from complex units of the past to today's less expensive models, which read spatially via a screen with background map and locating cursor. GPS tools are evolving to assist different applications and the costs are falling.

To track and analyze our herbicide treatments in weed eradication we need to have a record of where herbicides are applied. This can also assure that chemicals are applied in an environmentally safe manner. CDFA has taken a pioneering step towards tracking our treatments with the aid of a low cost, self-contained, GPS/ data logger system that is currently under trial by our field biologists.

CDFA's Integrated Pest Management office had explored the idea of integrated GPS/data logging technology tied to our sprayers over the past five years, but the developing technology was cost-prohibitive. Researchers at Auburn University first tipped off CDFA field biologists on an appropriate GPS system they were using for a reforestation project, which directed us to Darr Precision Solutions, whose custom design enabled CDFA to tailor a system to match our needs.

We sought a self-contained system that would record an herbicide applicator's location (track) across their survey terrain, and also the location (waypoint) where a targeted weed infestation was sprayed. We also needed records of application duration to calculate the amount of spray applied to a waypoint. The resulting system fits within the applicator's spray backpack and includes a removable "flash memory" for data downloads. For application purposes, this is a great

A lightweight GPS system – the black box on the tank above – can be attached to herbicide application backpacks to assist data collection.

improvement over previous systems designed to work out of vehicles. The backpack system can also be "hardened" – made more water-resistant – for field application or aquatic use, and adds only 5 lbs. to the backpack sprayer.

Once data is downloaded, tracks and waypoints are plotted onto a map using ESRI software, allowing spatial analysis. We can tell the approximate quantity of dilute herbicide solution delivered to the waypoint, which, being proportional to plant vigor, lets us approximate plant sizes and foliar densities. This is possible because an applicator uses a certain number of tank loads of dilute herbicide at the label rate, over the course of its 6 hour battery life. The applicator simply needs to know at the outset the quantity per tank load, the rate of herbicide to dilute, and the number of tanks that were delivered.

On a given day of fieldwork, Darr's GPS pack allows the following information to be gathered: location of the path walked (survey track); location of the herbicide application (waypoint); and the duration of spraying (time). At the end of the 6-hour workday, flash memory data can be downloaded to a main computer as a text file, and then purged from the flash drive in preparation for the next day's use. Currently, the system is powered by a gel cell lead acid battery, which can be recharged or replaced.

The cost of the system has been estimated in the $500 to $1000 range. It is splash proof and rugged enough for the field projects, but can be tailored and hardened to your application. ❖

For more information, contact:
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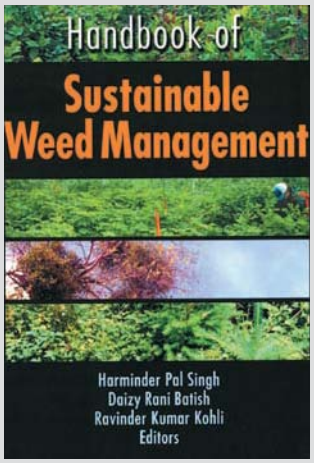
ResourcesResourcesResources

Handbook of Sustainable Weed Management

Edited by Harminder Pal Singh, Daizy Rani Batish, and Ravinder Kumar Kohli

Review by Gina Darin, CDFA



CDFA file image

Invasive weeds pose are a serious ecological and economic problem, but sometimes a cure can be worse than the disease, and control of these pests can create further environmental problems. Habitat may be disturbed during the process of mechanical removal, not to mention the risk of negative side effects from herbicide applications. Editors from Panjab University in Chandigarh, India have put together a comprehensive handbook on how to identify and use innovative strategies for managing weeds in an environment-protective manner. International in scope, they place an emphasis on crop production.

In the Handbook of Sustainable Weed Management, experts from Asia, Europe, North America, and Australia organize the scattered information on weeds and their management – from different ecosystems around the world – into one resource. The writing is very accessible, making complex information easy to understand. This book not only describes the various techniques for weed management, but shows you what methods work best for a given site, invasive weed, or invaded crop.

The compendium focuses on crops and increasing food production, but has information that may be applied in other settings as well, for designing weed management strategies that reduce herbicide usage and restore ecological balance. This book provides new insights and approaches for weed scientists, agronomists, agriculturalists, horticulturalists, farmers, extensions, teachers and students. Flip through these 800+ pages and rest assured that information on sustainable weed management is available. ❖

ZONES *continued from page 11...*

hardship for California ranchers (see Niell et al. in the previous edition of the *Noxious Times*).

WFZs are only one strategy in an integrated approach to managing C-rated weeds in California. Cost-share and other programs in heavily infested regions where a WFZ is not feasible will be essential for those bearing the brunt of the consequences of widespread invasions. This approach, however, can help remind stakeholders and encourage citizens that there are areas in the state that can and should be protected from invasive weeds like yellow starthistle. ❖

Save the date!

Statewide Weed Management Area 8th Annual Meeting

October 15-16, 2007

Woodland, CA

for more information, contact Steve Schoenig at sschoenig@cdfa.ca.gov

Upcoming Events

July 19, 2007
51st Weed Day 2007
Davis, CA
wric.ucdavis.edu/education/weedday07.html

August 5-7, 2007
Ecological Society of America & Society for Ecological Restoration, Joint Annual Meeting
San Jose, CA
www.esa.org

September 17-21, 2007
9th International Conference on the Ecology and Management of Alien Plant Invasions
Perth, Australia
www.congresswest.com.au/emapi9

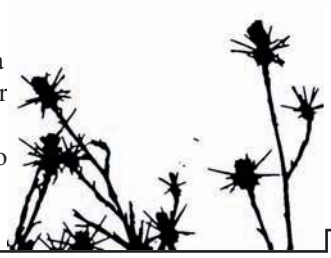
September 19-22, 2007
Cal-IPC Symposium
San Diego, CA
www.cal-ipc.org

California Invasive Weeds Awareness Week
July 16-20, 2007

Across the Golden State, invasive plants reduce plant diversity and wildlife habitat, consume needed water, reduce agicultural production and create fire hazards.

How can you help?

- LEARN to identify invasive plants in your area
- REPORT weed sighting to the land manager or local weed group
- SUPPORT local, state, and deferal efforts to control invasive weeds



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